Amplitude, Period, & Phase Shift

$$y = a\,\text{trig}\,bx$$

Step 1: Factor out b

Step 2: Amplitude: How high or low a graph goes: $|a|$

Step 3: Period: How long it takes a graph to repeat: $\frac{2\pi}{|b|}$

Step 4: Phase Shift: Inside ( )'s: right (-) / left (+)

Ex) $y = \sin x$

Ex) $y = \frac{3\pi}{8}\cos(2x - \pi/4)$

Ex) $y = 3\cos 4x$

Ex) $-7/9\cos(11x + 2\pi/3) = y$

Ex) $y = \cos x$

Ex) $-4/5\sin(2/3x + \pi/6) = y$

Ex) $y = -8\sin 9x$

Draw and label the right triangle in the correct quadrant.

Ex) $\tan\theta = 4/5$, $\pi < \theta < 3\pi/2$, find $\sin\theta$

Ex) $\csc\theta = -2$, $\cos > 0$, find $\tan\theta$

Ex) $\cot\theta = -10/3$, $\csc > 0$ find $\sec\theta$

Graphing Trig Functions

Even function: symmetric over y-axis

→ $y = \sec x$

→ $y = \cos x$

Odd function: symmetric through origin

→ $y = \sin x$ → $y = \tan x$

→ $y = \csc x$

→ $y = \cot x$

Domain: (∠'s)

sin & cos: All ∠'s

tan: All ∠'s except $90° + 270°$

csc: All ∠'s except $0° + 180°$

sec: All ∠'s except $90° + 270°$

cot: All ∠'s except $0° + 180°$

Range:

sin & cos $-1 \leq y \leq 1$

tan & cot $(-\infty, \infty)$

csc & sec $(-\infty, -1] \cup [1, \infty)$

Find the 6 trig ratios, ϕ and θ for the unit circle problem below.

$\left(-\frac{3}{4}, \frac{\sqrt{7}}{4}\right)$

$\sin\phi =$ $\quad$ $\csc\phi =$

$\cos\phi =$ $\quad$ $\sec\phi =$

$\tan\phi =$ $\quad$ $\cot\phi =$

Find the Amp, Per, and P/S

$y = -\frac{6}{7}\cos(-4\pi x - 10\pi)$

Find the remaining trig ratios, ϕ and θ given $\cot\theta = 4/5$, $\sin\theta < 0$

Evaluate. Give exact value.

1. $\cot 5\pi/6 =$

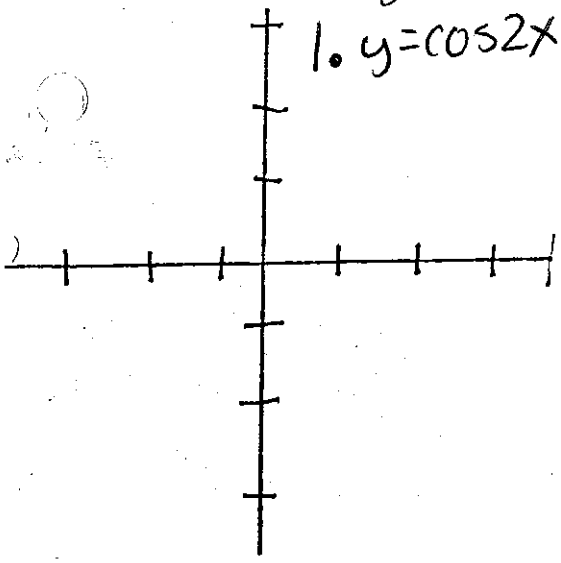
2. $\csc 9\pi/2 =$

3. $6\sec 11\pi/6 + 3/4 \tan \pi/3 =$

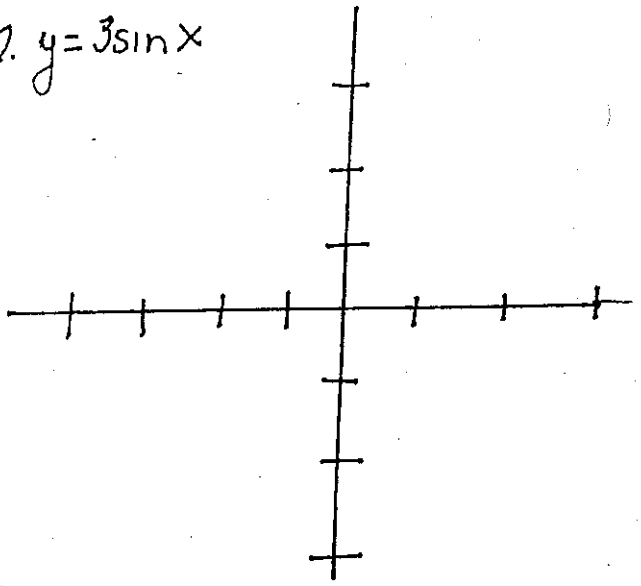
4. $-3\sin \pi/3 - 7\cos 7\pi/6 =$

Sketch the graph of

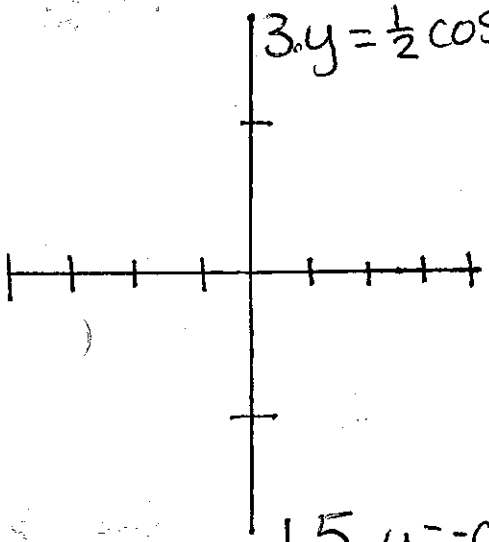
1. $y = \cos 2x$



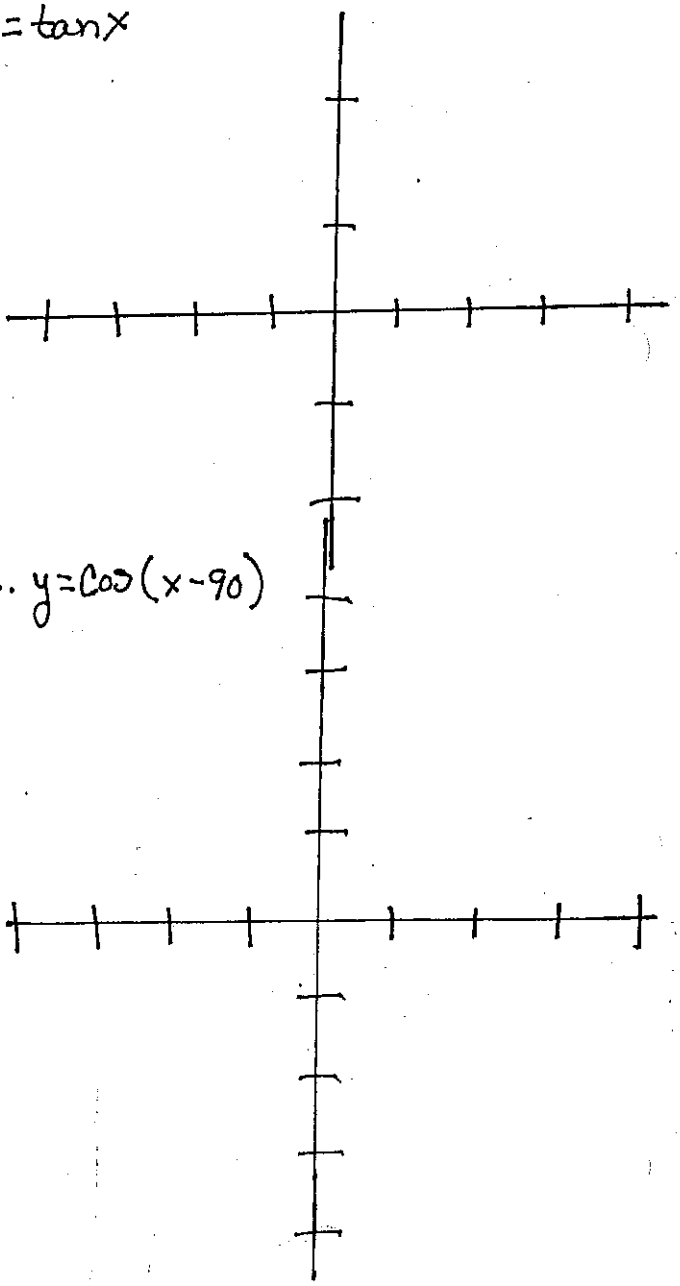
2. $y = 3\sin x$



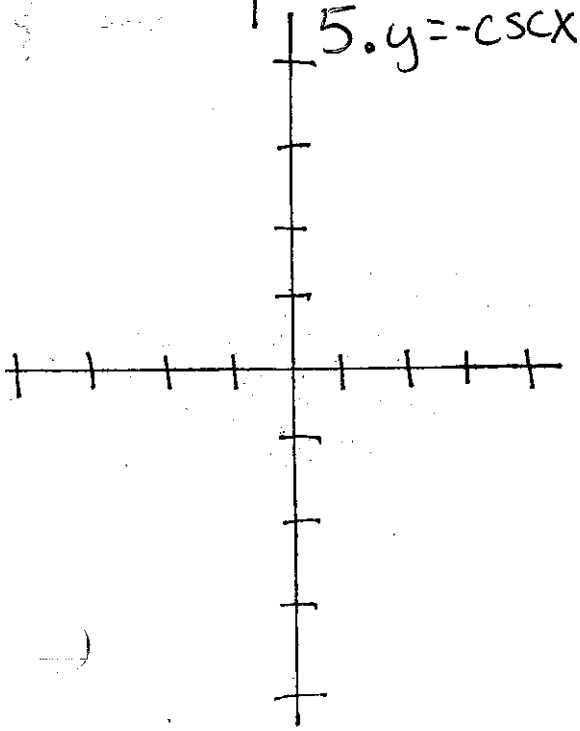
3. $y = \frac{1}{2}\cos x$



4. $y = \tan x$



5. $y = -\csc x$



6. $y = \cos(x - 90)$

Review for Test 2

Find the 6 trig ratios, ϕ & θ.

1. $(-3/5, 4/5)$

2. $(\sqrt{2}/2, -\sqrt{2}/2)$

3. $\left(\frac{-2\sqrt{5}}{5}, \frac{-\sqrt{5}}{5}\right)$

Find the remaining trig ratios, ϕ and θ.

4. $\sec\theta = 3$, $\tan\theta < 0$

5. $\cos\theta = -3/4$, $\sin\theta < 0$

Find Amp, Per, and P/S

6. $y = 4\sin(2x - \frac{1}{2}\pi)$

7. $y = -3\cos(-2x - \pi/2)$

8. $y = -7\sin(\pi/3x + 4/3)$

Find the exact value.

9. $\sin \frac{23\pi}{4}$

10. $\csc -\frac{17\pi}{6}$

11. $12\cot\frac{5\pi}{3} + 12\cos\frac{\pi}{4}$